Space Weather Forecast

Issued on Thursday, 05 September 2024 at 13:11 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate flares expected, chance of Strong flares. Slight but increasing chance of S1/Minor Radiation Storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity has been Moderate over the past 24 hours with a number of low level Moderate-class flares, peaking at 05/0856 UTC from a region on the west limb. There are currently seven sunspot regions on the visible disc. A region in the southwest is the largest and most complex on the disc, with a large number of mostly small spots, including some magnetic complexity. It is now starting to merge with the region behind it, however. The region on the west limb is now rotating off, so it is becoming impossible to analyse but there are hints of growth. A region in the southeast appears to have a fairly straightforward magnetic structure, as does the region following it, although this is still suffering from foreshortening near the limb which makes it difficult to classify. Remaining regions are smaller and mostly stable.

No Earth-directed Coronal Mass Ejections (CMEs) were observed in the last 24 hours, with a halo CME observed in coronagraph imagery assessed as far sided.

Solar Wind / Geomagnetic Activity: The solar wind showed CME effects gradually waning. The wind speed was mostly slightly elevated, varying between 370-470 km/s. The Interplanetary Magnetic Field was initially strong, but gradually eased to be mostly moderate. The north-south component was mostly northward directed, initially moderately but later weakly so. Geomagnetic activity was initially Unsettled to Active (Kp 3-4), easing to become Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is gradually easing following the rise in response to a flare on 01 Sep. It remains below the S1/Minor Radiation Storm level.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected with a chance of isolated Strong flares. The risk decreases very slightly on Day 3 (07 Sep) as the region currently on the west limb rotates well away, onto the far side.

Solar Wind / Geomagnetic Activity: Recent CME effects from the 01 Sep CME are now declining, with no further CMEs currently expected to arrive at Earth. A fast wind from a coronal hole in the northern hemisphere may bring elevated wind speeds on Day 3 or perhaps into Day 4 (07-08 Sep).

On the whole, geomagnetic activity is expected to be largely Quiet to Unsettled (Kp 1-3), perhaps reaching Active (Kp 4) with a slight chance of G1/Minor Storms (Kp 5) on Day 3 into Day 4 should the fast wind occur.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is currently above background levels, but below the S1/Minor Radiation Storm threshold. There is a slight but increasing chance of exceeding S1 in the coming days.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	15	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	80	80	70	70
Very Active	R3 to R5 X	No	25	25	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	20	25	25
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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